

**IN THE CLAIMS**

- 1-38. (canceled)
39. (new) A preparation of an isolated mammalian serine racemase wherein the serine racemase comprises the amino acid sequence shown in SEQ ID NO:8.
40. (new) An isolated polynucleotide that encodes the amino acid sequence shown in SEQ ID NO:8.
41. (new) The isolated polynucleotide of claim 40 that comprises SEQ ID NO:1.
42. (new) An expression construct comprising a polynucleotide that encodes the amino acid sequence shown in SEQ ID NO:8.
43. (new) The expression construct of claim 42 wherein the polynucleotide comprises SEQ ID NO:1.
44. (new) A host cell comprising an expression construct comprising a polynucleotide that encodes the amino acid sequence shown in SEQ ID NO:8.
45. (new) The host cell of claim 44 which is mammalian.
46. (new) The host cell of claim 44 wherein the expression construct comprises SEQ ID NO:1.
47. (new) A method of producing a mammalian serine racemase comprising the steps of:  
culturing a host cell according to claim 44 in a culture medium; and  
recovering a mammalian serine racemase from the culture medium or the host cell.
48. (new) The method of claim 47 wherein the host cell is mammalian.

49. (new) The method of claim 47 wherein the expression construct comprises SEQ ID NO:1.

50. (new) A preparation of an isolated mammalian serine racemase wherein the serine racemase comprises the amino acid sequence shown in SEQ ID NO:10.

51. (new) An isolated polynucleotide that encodes the amino acid sequence shown in SEQ ID NO:10.

52. (new) The isolated polynucleotide of claim 10 that comprises SEQ ID NO:9.

53. (new) An expression construct comprising a polynucleotide that encodes the amino acid sequence shown in SEQ ID NO:10.

54. (new) The expression construct of claim 53 that comprises SEQ ID NO:9.

55. (new) A host cell comprising an expression construct that comprises a polynucleotide that encodes the amino acid sequence shown in SEQ ID NO:10.

56. (new) The host cell of claim 55 which is mammalian.

57. (new) The host cell of claim 55 wherein the expression construct comprises SEQ ID NO:9.

58. (new) A method of producing a mammalian serine racemase comprising the steps of:

culturing a host cell according to claim 55 in a culture medium; and  
recovering a mammalian serine racemase from the culture medium or the host cell.

59. (new) The method of claim 56 wherein the expression construct comprises SEQ ID NO:9.

60. (new) The method of claim 58 wherein the host cell is mammalian.

61. (new) A method to screen compounds to identify candidate therapeutic agents comprising the steps of:

contacting a test compound with a mammalian serine racemase comprising the amino acid sequence shown in SEQ ID NO:8;

assaying activity of the mammalian serine racemase; and

identifying a test compound as a candidate therapeutic agent if it modulates the activity of the mammalian serine racemase.

62. (new) The method of claim 61 wherein the candidate therapeutic agent inhibits the activity of the mammalian serine racemase.

63. (new) The method of claim 61 wherein the candidate therapeutic agent increases the activity of the mammalian serine racemase.

64. (new) A method to screen compounds to identify candidate therapeutic agents comprising the steps of:

contacting a test compound with a mammalian serine racemase comprising the amino acid sequence shown in SEQ ID NO:10;

assaying activity of the mammalian serine racemase; and

identifying a test compound as a candidate therapeutic agent if it modulates the activity of the mammalian serine racemase.

65. (new) The method of claim 64 wherein the candidate therapeutic agent inhibits the activity of the mammalian serine racemase.

66. (new) The method of claim 64 wherein the candidate therapeutic agent increases the activity of the mammalian serine racemase.

67. (new) A preparation of isolated mammalian serine racemase having a specific activity of at least 0.075  $\mu$ mole L-serine/mg/hour, wherein the serine racemase comprises an amino acid sequence that is at least 85% identical to SEQ ID NO:8 or SEQ ID NO:10 as determined according to the Smith-Waterman homology search algorithm, using an affine gap search with gap open penalty of 12 and a gap extension penalty of 1.

68. (new) The preparation of claim 67 wherein the specific activity is at least 1  $\mu$ mole L-serine/mg/hour.

69. (new) The preparation of claim 67 wherein the specific activity is at least 2.5  $\mu$ mole L-serine/mg/hour.

70. (new) The preparation of claim 68 wherein the specific activity is at least 5  $\mu$ mole L-serine/mg/hour.

71. (new) The preparation of claim 67 wherein the amino acid sequence is at least 90% identical.

72. (new) The preparation of claim 67 wherein the amino acid sequence is at least 95% identical.

73. (new) The preparation of claim 67 wherein the amino acid sequence is at least 96% identical.

74. (new) The preparation of claim 67 wherein the amino acid sequence is at least 97% identical.

75. (new) The preparation of claim 67 wherein the amino acid sequence is at least 98% identical.

76. (new) The preparation of claim 67 wherein the amino acid sequence is at least 99% identical.

77. (new) A polynucleotide encoding the mammalian serine racemase of claim 67.

78. (new) An expression construct comprising the polynucleotide of claim 77.

79. (new) A host cell comprising the expression construct of claim 78.

80. (new) The host cell of claim 79 which is mammalian.

81. (new) A method of producing a mammalian serine racemase comprising the steps of:

culturing a host cell according to claim 79 in a culture medium; and  
recovering a mammalian serine racemase from the culture medium or the host cell.

82. (new) The method of claim 81 wherein the host cell is mammalian.

83. (new) A method to screen compounds to identify candidate therapeutic agents comprising the steps of:

contacting a test compound with the mammalian serine racemase of claim 67;  
assaying activity of the mammalian serine racemase; and  
identifying a test compound as a candidate therapeutic agent if it modulates the activity of the mammalian serine racemase.

84. (new) The method of claim 83 wherein the candidate therapeutic agent inhibits the activity of the mammalian serine racemase.

85. (new) The method of claim 83 wherein the candidate therapeutic agent increases the activity of the mammalian serine racemase.

86. (new) An isolated polynucleotide that is at least 85% identical to the nucleotide sequence shown in SEQ ID NO:1 or SEQ ID NO:9 as determined according to the Smith-Waterman homology search algorithm, using an affine gap search with gap open penalty of 12 and a gap extension penalty of 1, wherein the polynucleotide encodes a mammalian serine racemase having a specific activity of at least 0.003 μmole L-serine/mg/hour.

87. (new) The polynucleotide of claim 86 that is at least 90% identical.

88. (new) The polynucleotide of claim 86 that is at least 95% identical.

89. (new) The polynucleotide of claim 86 that is at least 96% identical.

90. (new) The polynucleotide of claim 86 that is at least 97% identical.

91. (new) The polynucleotide of claim 86 that is at least 98% identical.

92. (new) The polynucleotide of claim 86 that is at least 99% identical.

93. (new) An expression construct comprising the polynucleotide of claim 86.

94. (new) A host cell comprising the expression construct of claim 93.

95. (new) The host cell of claim 94 that is mammalian.

96. (new) A method of producing a mammalian serine racemase comprising the steps of:

culturing a host cell according to claim 94 in a culture medium; and  
recovering a mammalian serine racemase from the culture medium or the host cell.

97. (new) The method of claim 96 wherein the host cell is mammalian.